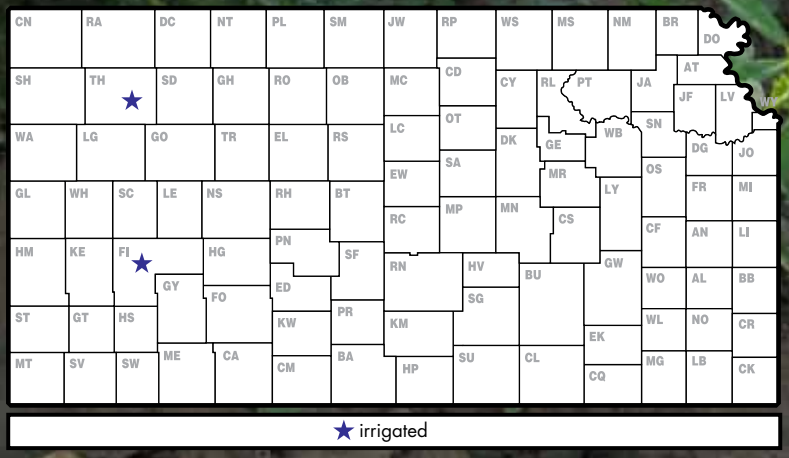
2009

Kansas Performance Tests with

Alfalfa Varieties

Report of Progress 1025



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Entrants in 2009 Kansas Alfalfa Performance Tests

Allied Seed
(Allied)
Nampa, ID
208-466-6700
www.alliedseed.com

Garst Seed Co.
(Garst)
Greensburg, KS
620-546-5955
garstseed.com

Mycogen Seeds
(Mycogen)
Indianapolis, IN
317-337-7568

Syngenta Seeds, Inc.
(NK)
Golden Valley, MN
763-593-7324
www.nk-us.com

Croplan Genetics
(Croplan Genetics)
St. Paul, MN
800-851-8810
www.croplangenetics.com

Great Plains Research Co.
(Cimarron USA)
Cary, NC
800-874-7945
www.CimarronUSA.com

NC+ Hybrids
(NC+)
Lincoln, NE
800-365-9804
www.nc-plus.com

W-L Research, Inc.
(W-L)
Madison, WI
608-295-3566

Dairyland Seed Co.
(Dairyland)
West Bend, WI
800-236-0163
www.dairylandseed.com

KSU- Foundation Seed
(KS AES)
Manhattan, KS
785-532-6115
www.agronomy.ksu.edu

PGI Alfalfa, Inc.
(PGI)
Woodland, CA
866-744-5710

Foundation Seed Division
(NE AES & USDA)
Lincoln, NE
877-229-1363

Monsanto Seed
(Dekalb)
St. Louis, MO
800-335-2676

Pioneer Hi-Bred Intl., Inc.
(Pioneer)
Johnston, IA
800-247-6803
www.pioneer.com

Contribution No. 10-221-S from the Kansas Agricultural Experiment Station.

2009 PERFORMANCE TESTS

Objectives and Procedures

The Kansas Agricultural Experiment Station established an official alfalfa testing program in 1980 to provide Kansas growers with unbiased performance comparisons of alfalfa varieties marketed in the state. Every three years, private companies are asked to enter varieties voluntarily at the locations slated for establishment that year. Announcements and entry forms are mailed to private companies in June for entry in fall-seeded tests. Companies enter varieties of their choice and pay entry fees to cover part of the costs of conducting the tests. Most tests are planted in mid-August or September, but the southeast Kansas test usually is planted in the spring. Individual tests are conducted for a minimum of three years. New tests typically are established during the final production year of the previous test, or more frequently if there is enough interest.

Descriptive information is presented with the results for each test. This information, including soil type, establishment methods, fertilization, pest control, irrigation, harvest dates, and growing conditions unique to that location, can help explain test and/or variety performance.

Forage yields were estimated by harvesting four replications of each variety with a plot harvester. The amount of forage produced from a specific area (35 to 80 ft^2) was weighed, and a subsample was taken to determine moisture content. This information was used to convert the plot weights to tons of dry matter per acre for each cutting, the season total, and the total for each previous season, as presented in Tables 1 and 2. The forage yield over the lifetime of a particular test is presented as the total tons of dry matter produced per acre, as the total tons of 15% moisture hay, and as a percentage of the test average.

Each table is separated into three sections. The first lists released cultivars that are generally available on the seed market or soon will be. The second section includes experimental cultivars that were entered in the test before being released for sale. These experimental lines often represent an earlier generation of seed than that used for the released cultivars. The third section includes summary statistics unique to that test.

At the bottom of each column, the least significant difference (LSD) is listed at the 0.05 and 0.20 levels. These values indicate how large a difference is needed to be confident that one variety is superior to another. Differences between varieties that are equal to or greater than the 0.05 LSD have only a 1 in 20 chance of being due to chance or error. Differences equal to or greater than the 0.20 LSD have a 1 in 5 chance of being caused by chance or error.

The coefficient of variability (CV) provides an estimate of the consistency of the results of a particular test. In these tests, CV less than 10% generally indicate reliable, uniform data, whereas CV of 10 to 15% are not uncommon and generally indicate the data are acceptable for rough comparisons. Tests with CV greater than 15% still may be useful, but variety comparisons lack precision.

The mean coefficient of variability (MCV) is similar to the CV in that it serves as an indicator of test precision. The MCV is calculated by dividing the 0.05 LSD by the test mean (average) and multiplying by 100. The MCV reveals the percentage difference required to detect differences between varieties with 95% confidence.

Variety Characterization

For variety selection, producers should consider the performance of a variety in each of the current tests in which it appears, its performance over time and locations relative to familiar or check varieties, and the disease and insect resistance characteristics that are potentially important in specific situations.

Tables 1 and 2 contain updated yield data from individual tests currently in progress. First-season yields for a spring-planted test often are more variable than yields in subsequent years. Season totals are important, but yield distribution during the season might differ among varieties. Examine yields from individual cuttings to determine if differences in yield distribution exist. Yield totals over many years provide the best measure of variety performance over time.

Table 3 provides winter survival, disease and insect-resistance, multifoliolate expression, and continuous grazing tolerance ratings for released varieties. These ratings were obtained primarily from the annual "Winter Survival, Fall Dormancy & Pest Resistance Ratings for Alfalfa Varieties" pamphlet published by the National Alfalfa Alliance. That report summarizes information submitted by developers of alfalfa varieties as part of the variety registration process. The Association of Official Seed Certifying Agencies National Alfalfa Variety Review Board reviewed the ratings before they were published. Companies submitting varieties for the tests provided ratings for some unregistered varieties. Experimental varieties are also listed in Table 3 for brand identification.

Table 1. Southwest Kansas, Garden City Alfalfa Performance Test, Seeded August 30, 2006

Monty Spangler, agronomist
Southwest Research-Extension Center, Garden City, Keith silt loam
30 lb seed/acre
Plots 3'x20'; 3'x20' harvested
22-100-0 lb/a of N-P-K after first cutting

Beneficial rain distribution led to good growing season.

	Forage Yield									
	tons/acre									
	Dry Matter									
	2009								Total, 15%	Total, % of
NAME	5-29	6-29	8-8	9-10	2009	2008	2007	Total	Moist.	Mean
RELEASED CULTIVARS										
Cimarron VL400	7.10	2.20	2.30	1.40	13.00		12.03	13.00	15.29	111
Mountaineer 2.0	6.28	2.53	2.38	1.55	12.73		12.27	12.73	14.97	109
Perry	6.23	2.55	2.38	1.53	12.68		11.63	12.68	14.91	108
4A421	5.83	2.55	2.50	1.53	12.40		12.48	12.40	14.59	106
GH 727	5.18	2.83	2.45	1.78	12.23		12.61	12.23	14.38	104
6530	5.90	2.48	2.30	1.55	12.22		12.59	12.22	14.38	104
Kanza	5.65	2.65	2.23	1.65	12.18		11.57	12.18	14.32	104
Reward II	5.70	2.43	2.33	1.73	12.18		12.48	12.18	14.32	104
WL 357 HQ	5.85	2.48	2.28	1.55	12.15		12.54	12.15	14.29	104
FSG505	5.40	2.48	2.43	1.68	11.98		12.66	11.98	14.09	102
Hybri+421	5.10	2.58	2.55	1.75	11.98		12.33	11.98	14.09	102
FSG408DP	5.10	2.60	2.43	1.73	11.85		12.14	11.85	13.94	101
Pioneer 54Q25	5.23	2.53	2.28	1.65	11.68		12.47	11.68	13.74	100
Rebound 5.0	4.75	2.55	2.43	1.78	11.50		12.82	11.50	13.53	98
Mariner III	4.85	2.65	2.38	1.58	11.45		12.59	11.45	13.47	98
Pioneer 54V46	4.70	2.48	2.40	1.75	11.33		12.42	11.33	13.32	97
WL 355 RR	4.75	2.48	2.35	1.73	11.30		12.59	11.30	13.29	96
Pioneer 54V09	4.85	2.53	2.20	1.60	11.18		12.73	11.18	13.15	95
MP04	5.33	2.10	2.18	1.53	11.13		11.39	11.13	13.09	95
4G418RR	4.75	2.40	2.23	1.73	11.10		12.27	11.10	13.06	95
6420	4.53	2.48	2.40	1.65	11.05		12.48	11.05	13.00	94
6415	4.55	2.25	2.38	1.80	10.98		12.96	10.98	12.91	94
Escalade	4.45	2.58	2.30	1.60	10.93		11.92	10.93	12.85	93
Expedition	4.10	2.70	2.38	1.65	10.83		12.59	10.83	12.74	92
Marvel	4.08	2.50	2.33	1.85	10.75		12.99	10.75	12.65	92
DKA41-18RR	4.08	2.70	2.33	1.65	10.75		12.30	10.75	12.65	92
Phoenix	4.43	2.40	2.25	1.60	10.68		11.77	10.68	12.56	91
FSG406	4.13	2.83	2.48	1.25	10.68		12.57	10.68	12.56	91
Artesian Sunrise	4.43	2.40	2.25	1.58	10.65		12.08	10.65	12.53	91
Genoa	4.08	2.50	2.35	1.73	10.65		12.61	10.65	12.53	91
WL 343 HQ	3.73	2.63	2.18	1.53	10.05		11.68	10.05	11.82	86
EXPERIMENTAL STRAINS										
4S419	6.83	2.63	2.50	1.88	13.83		13.30	13.83	16.26	118
I Chg 04	7.05	2.65	2.43	1.63	13.75		11.95	13.75	16.18	117
msSunstra-614	6.45	2.63	2.53	1.85	13.45		12.32	13.45	15.82	115
FG 52M146	5.70	2.60	2.28	1.60	12.18		12.72	12.18	14.32	104
msSunstra-613	4.70	2.70	2.28	1.75	11.43		12.28	11.43	13.44	97
DS961	4.35	2.60	2.58	1.83	11.35		11.48	11.35	13.35	97
DS253	4.10	2.58	2.70	1.93	11.30		11.43	11.30	13.29	96
SUMMARY STATISTICS										
Average	5.14	2.55	2.37	1.67	11.72		12.32	11.72	13.79	100
LSD (0.05)	1.73	0.24	0.26	0.22	1.82		0.61	1.82	2.14	16
LSD (0.20)	1.13	0.16	0.17	0.15	1.19		0.40	1.19	1.39	10
CV (%)	12.40	6.80	7.93	9.60	11.09		3.55	11.09	11.09	11
MCV (%)	17.38	9.53	11.11	13.45	15.53		4.98	15.53	15.53	16

Table 2. Northwest Kansas, Colby Alfalfa Performance Test, Seeded August 24, 2006

Pat Evans, agronomist

Northwest Research-Extension Center, Colby, Keith silt loam

18 lb seed/acre

Plots 3'x20'; 3'x17' harvested

14-46-0 lb/a of N-P-K before planting

Growing conditions were normal with no insect problems.

	Forage Yield									
	tons/acre									
	Dry Matter									
	2009								Total, 15%	Total, % of
NAME	6-8	7-9	8-12	9-9	2009	2008	2007	Total	Moist.	Mean
RELEASED CULTIVARS										
Hybri+421	2.97	2.77	2.35	1.54	9.63		8.99	9.63	11.33	113
DKA41-18RR	3.39	2.70	2.23	1.22	9.53		8.47	9.53	11.22	111
Rebound 5.0	3.34	2.71	1.82	1.57	9.43		8.56	9.43	11.10	110
4G418RR	3.54	2.04	2.14	1.64	9.36		8.07	9.36	11.01	109
Mountaineer 2.0	3.23	2.16	1.88	1.51	8.77		8.57	8.77	10.32	102
Pioneer 54Q25	2.64	2.42	1.78	1.72	8.56		8.87	8.56	10.07	100
Kanza	2.99	2.26	1.79	1.51	8.55		8.62	8.55	10.06	100
WL 355 RR	2.96	2.06	1.85	1.57	8.44		8.13	8.44	9.93	99
Pioneer 54V46	3.26	2.06	1.90	1.20	8.42		8.38	8.42	9.91	98
Perry	3.18	1.77	1.94	1.45	8.34		7.85	8.34	9.82	98
Pioneer 54V09	3.00	1.83	1.99	1.34	8.17		8.59	8.17	9.61	95
4A421	2.51	2.61	1.60	1.41	8.13		8.57	8.13	9.56	95
WL 343 HQ	2.70	2.33	1.77	1.17	7.98		8.25	7.98	9.39	93
Jade III	2.65	2.28	1.51	1.27	7.71		8.14	7.71	9.07	90
6400HT	2.80	1.64	1.91	0.99	7.34		8.13	7.34	8.63	86
SUMMARY STATISTICS										
Average	3.01	2.24	1.90	1.41	8.56		8.41	8.56	10.07	100
LSD (0.05)	0.47	0.30	0.25	0.30	0.71		0.87	0.71	0.84	8
LSD (0.20)	0.31	0.20	0.16	0.19	0.71		0.56	0.71	10.05	8
CV (%)	11.05	9.45	9.27	15.01	5.84		7.23	5.84	5.84	6
MCV (%)	15.77	13.48	13.23	21.42	8.34		10.32	8.34	8.34	8

Table 3. 2009 Performance test entries with disease and insect resistance ratings for released varieties*

Brand Name	WS	BW	VW	FW	AN	PRR	SAA	PA	BAA	SN	APH1	APH2	SRKN	NRKN	PL	MLE	GT
Allied																	
Escalade	-	H	R	R	R	H	MR	R	-	-	R	-	-	-	-	-	-
FSG406	1	H	H	H	H	H	-	R	-	R	H	-	-	R	-	H	-
FSG408DP	2	H	R	H	H	H	-	R	-	R	R	-	-	H	-	-	-
FSG505	2	H	H	H	H	H	R	R	-	R	H	-	-	R	-	-	-
Mariner III	2	H	H	H	H	H	-	R	-	R	H	R	-	H	-	-	-
Marvel	2	H	H	H	H	H	R	R	-	-	H	-	-	-	-	H	-
Phoenix	4	H	H	H	H	H	-	H	-	H	R	-	-	MR	-	-	-
Cimarron USA																	
Cimarron VL400	-	R	R	H	H	H	H	H	R	R	R	-	S	-	-	-	-
I Chg 04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MP04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Croplan Genetics																	
Artesian Sunrise	-	M	R	R	H	H	H	H	R	R	-	-	-	R	-	H	-
Mountaineer 2.0	2	H	R	H	H	H	R	H	-	H	R	-	-	R	-	H	-
Rebound 5.0	2	H	H	H	H	H	-	R	-	-	H	-	-	-	-	H	-
Dairyland Seed																	
DS253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DS961	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
msSunstra-613	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
msSunstra-614	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Forage Genetics																	
FG 52M146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Garst																	
6400HT	2	H	H	H	H	H	-	H	-	-	H	-	-	-	-	-	Y
6415	1	H	H	H	H	H	R	R	-	-	H	-	-	-	-	H	-
6420	2	H	R	H	R	H	R	R	-	R	R	-	-	H	-	-	-
6530	-	H	H	H	H	H	-	H	-	R	H	M	-	-	-	-	-
Golden Harvest																	
GH 727	1	H	H	H	H	H	-	R	-	R	H	-	-	-	-	H	
KS AES & USDA																	
Kanza	-	R	-	-	-	-	R	R	-	-	-	-	-	-	-	-	-
Monsanto																	
DKA41-18RR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mycogen																	
4A421	-	H	H	H	H	H	H	H	-	-	H	-	-	M	-	-	-
4G418RR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4S419	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NC+																	
Hybri+421	2	H	R	H	H	H	R	R	-	R	R	-	-	H	-	-	-
Jade III	2	H	R	H	H	H	R	R	R	R	R	-	-	H	-	-	-
NE AES & USDA																	
Perry	-	R	-	-	L	-	M	R	-	-	-	-	-	-	M	-	-
NK																	
Expedition	3	R	H	H	H	H	R	-	-	R	H	-	-	R	-	-	-
Genoa	1	H	H	H	H	H	-	R	-	R	H	-	-	-	-	-	-
PGI																	
Reward II	2	H	R	H	R	H	R	R	R	R	R	-	-	H	-	-	-
Pioneer																	
54Q25	-	H	H	H	H	H	R	R	-	H	R	-	-	H	-	-	-
54V09	-	H	H	R	H	H	R	H	-	H	R	MR	-	H	-	-	-
54V46	-	R	H	H	H	H	R	R	L	M	H	R	-	H	-	-	-
W-L Research																	
WL 343 HQ	1	H	H	H	H	H	-	H	-	R	H	-	-	-	-	H	
WL 355 RR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL 357 HQ	2	H	H	H	H	H	-	H	-	-	H	-	-	-	-	-	-

*WS = Winter survival, 1 = superior
BW = Bacterial wilt
VW = Verticillium wilt
FW = Fusarium wilt
AN = Anthracnose race 1
PRR = Phytophthora root rot
SAA = Spotted alfalfa aphid
PA = Pea aphid
BAA = Blue alfalfa aphid
SN = Stem nematode
APH1 = Aphanomyces root rot race 1
APH2 = Aphanomyces root rot race 2
SRKN = Southern root knot nematode
NRKN = Northern root knot nematode
PL = Potato leafhopper
MLE = Multifoliolate expression

Disease and insect resistance ratings are from National Alfalfa Alliance descriptions or developers of the varieties.

GT = Continuous grazing tolerance, Y/N

Pest resistance ratings:

Code	Resistance class	% Resistant plants
S	Susceptible	0-5%
L	Low Resistance	6-14%
M	Moderate Resistance	15-30%
R	Resistance	31-50%
H	High Resistance	>50%
-	Not adequately tested	

To access crop performance testing information electronically, visit our Web site. The information contained in this publication, plus more, is available for viewing or downloading at:

www.agronomy.ksu.edu/kscpt

Excerpts from the
University Research Policy Agreement with Cooperating Seed Companies

Permission is hereby given to Kansas State University (KSU) to test varieties and/or hybrids designated on the attached entry forms in the manner indicated in the test announcements. I certify that seed submitted for testing is a true sample of the seed being offered for sale.

I understand that all results from Kansas Crop Performance Tests belong to the University and the public and shall be controlled by the University so as to produce the greatest benefit to the public. Performance data may be used in the following ways: 1) Tables may be reproduced in their entirety provided the source is referenced and data are not manipulated or reinterpreted; 2) Advertising statements by an individual company about the performance of its entries may be made as long as they are accurate statements about the data as published, with no reference to other companies' names or cultivars. In both cases, the following must be included with the reprint or ad citing the appropriate publication number and title: "See the official Kansas State University Agricultural Experiment Station and Cooperative Extension Service Report of Progress 1025, '2009 Kansas Performance Tests with Alfalfa Varieties,' or the Kansas Crop Performance Test Web site, *www.agronomy.ksu.edu/kscpt*, for details. Endorsement or recommendation by Kansas State University is not implied."

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